Groundwater Model

Water moves underground between soil and rock material. It always moves downhill forming streams and rivers, eventually ending up as groundwater. This model demonstrates how water is stored, moves, and susceptible to various pollutants.

Grade Level
Middle, High School

Time Frame
10-minutes prep time
30-minutes

Learning Objectives	Vocabulary	Science TEKS	Materials
Students will: • Recognize different sources of point-source pollution. • Visualize how water flows underground.	*Groundwater,* *Aquifer* *Well* *Pollution*	Science: 6.1(B), 6.3(B),(C); 7.1(B); 7.3(B),(C), 7.8(C); 8.1(B), 8.3(B)(C), 8.11(B)	• Groundwater model kit (includes model, syringe, tubing, wooden blocks, cake picture, food coloring, 2 L bottles) • 1 L of water

Background
Allow time to practice and become familiar with the model before you present to the class. Use the wooden blocks to hold the model.

Play the following video for some background information on *groundwater*: http://bit.ly/1f3W3zJ

5E Instructional Model

Engage
1. Ask students, where do we get our water in El Paso?
2. Explain to students that we get more than 50% of our water from *groundwater,* especially when we are in a drought.
    a. Water always flows downhill and eventually ends up beneath our feet. Water flows between the tiny spaces in the soil, ending up in *aquifers*.

Explore
3. The *groundwater* model represents a cross section of the Earth's layers.

   a. Show them the picture of the cake and compare it to the *groundwater* model.
4. Put the red colored water in the landfill and storage area. The red water represents *point-source pollution.*
5. Put the blue colored water in the *wells*.
6. When it rains the *aquifer recharges*. Demonstrate how water flows from the *recharge* area to the rest of the model (it fills the stream).
7. Open the stream channel to show how water table can fall.
   a. Ask students what happens when the *aquifers* fail to recharge.
8. Take the syringes and pump water from the *wells*.
   a. Tell students to describe what they see.

Elaborate

9. Now look at the landfill and storage area.
   a. What happens when there is a leak or crack in landfills or storage areas? This is *point-source pollution*.
10. Show students how water moves. Using the syringe pull water from one of the wells. Ask students, what direction do they think they water will move.

Evaluate

11. Ask students to give examples of *pollution* to *groundwater*.
   a. Tell them to think of the Rio Grande.
   b. What are *pollution* sources in the Rio Grande?

12. Have students form into groups and have the students illustrate how water is stored in an aquifer, how groundwater can become contaminated, and how this contamination ends up in a drinking water source. Students will do this by working on their very own mini groundwater model. Have each group explain the different aspects of groundwater and groundwater contamination covered in the groundwater model presentation to check understanding.

Useful websites
Groundwater Fact Sheet: http://bit.ly/1gHBUQh
Texas Groundwater and Drought: http://1.usa.gov/1kJUqfW